CLAIMS

1. The method of manufacture of thin film magnetic disks and other planar magnetic memory devices of the type which include a substrate which carries a thin magnetic film deposited on the surface of an electroless plated nickel alloy layer, the improvement comprising the steps of providing a substrate having a surface with an average surface roughness of about 30 Angstroms, or smoother, and vacuum-sputter deposition of a thin metallic layer onto the surface of the substrate, said thin metallic layer selected to bind to the substrate, thereby masking chemical and mechanical variations of the substrate, and to reactively or catalytically nucleate the electroless plating of said nickel alloy in a subsequent wet chemistry step.

2. The method of claim 1 in which the substrate is an aluminum alloy and the nickel alloy layer is a nickel-phosphorus alloy deposited by an electroless process.

3. The method of claim 1 in which the reactive nucleating layer is a sacrificial reactive metallic layer of zinc.

4. The method of claim 1 in which the catalytically nucleating metallic layer is a non-magnetic nickel-phosphorus alloy or a non-magnetic alloy of iron or of cobalt or of nickel in combination with singly or multiply added alloying materials.

5. The method of claim 1 in which said nucleating metallic layer comprises a first thin non-magnetic binder layer which bonds to the substrate and thereby presents a new chemistry different from that of the substrate and a top second non-magnetic thin layer which bonds to the first layer and which nucleates the electroless plating of the nickel alloy either reactively, or catalytically.

6. The method of claim 5 in which the thin binder layer is selected from the group comprising chromium, titanium, alloy mixtures of chromium and titanium, alloy mixtures of

chromium and vanadium, alloy mixtures of titanium and tungsten and other metallic mixtures or elements known as promoters of adhesion.

7. The method of claim 5 in which said binder layer is selected from the group comprising zirconium, niobium, rhenium, vanadium, molybdenum, tungsten, chromium, nickel, copper, titanium, silicon or alloy combinations of these elements.

8. The method of claims 1 or 5, wherein said substrate is an aluminum alloy.

9. The method of claims 1 or 5, wherein said substrate is ceramic or glass or glass-ceramic or composite materials containing said substances.

10. The method of claims 1 or 5 in which the substrate is a light-weight high-strength metal selected from the group of magnesium and its alloys or titanium and its alloys or other non-magnetic alloys as typified by beryllium copper, manganese steel and certain austenitic stainless steels.

11. The method of claims 1 or 5 in which the substrate is an organic, inorganic, or polymeric material.

12. The method of claims 1 or 5 wherein said substrate is comprised of carbon or graphitic substances or composite materials.

13. The method of claims 1 or 5 wherein said substrate has a first side and a second side, and said nucleating layer is applied to only said first side of said substrate.

14. The method of claim 1, wherein the average surface roughness is about 20 Angstroms or less.

15. A magnetic memory device, comprising:

a drive motor and head assembly; and one or more magnetic disks comprising:

a substrate having a super smooth surface;

a thin metallic layer on the super smooth surface of the substrate and having a surface opposite the super smooth surface of the substrate, the thin metallic layer comprising a material selected to bind to the substrate and to mask chemical and mechanical variations of the substrate, and to reactively or catalytically nucleate the electroless plating of nickel alloy;

a nickel alloy layer on the surface of the thin metallic layer, the nickel alloy layer having a super smooth surface; and

a magnetic layer on the super smooth surface of the nickel alloy layer.

16. The device of claim 15, wherein said substrate comprises an alloy of aluminum.

17. The device of claim 15, wherein said substrate comprises a highly polished, cold-worked alloy of aluminum.

18. The device of claim 15, wherein said nickel alloy layer comprises a non-magnetic, nickel-phosphorous alloy.

19. The device of claim 15, wherein said metallic layer comprises a reactively nucleating material.

20. The device of claim 15, wherein said metallic layer comprises a sacrificial layer comprising zinc.

21. The device of claim 15, wherein said metallic layer comprises a catalytically nucleating material.

22. The device of claim 15, wherein said metallic layer comprises a non-magnetic nickel-phosphorus alloy.

23. The device of claim 15, wherein said metallic layer comprises a non-magnetic iron alloy, a non-magnetic cobalt alloy or a non-magnetic nickel alloy.

24. The device of claim 15, wherein said metallic layer comprises a first binder layer on the super smooth surface of the substrate, and a second nucleating layer on the first binder layer.

25. The device of claim 15, wherein said metallic layer comprises a first binder layer on the super smooth surface of the substrate, and a second nucleating layer on the first binder layer, and wherein the first binder layer comprises a material selected from the group comprising chromium, titanium, alloy mixtures of chromium and titanium, alloy mixtures of chromium and vanadium, alloy mixtures of titanium and tungsten and other metallic mixtures or elements known as promoters of adhesion.

26. The device of claim 15, wherein said substrate comprises ceramic or glass.

27. The device of claim 15, wherein said substrate comprises magnesium, magnesium alloy, titanium, titanium alloy, beryllium copper, manganese steel, or austenitic stainless steel.

28. The device of claim 15, wherein said substrate comprises organic material.

29. The device of claim 15, wherein said substrate comprises polymeric material.

30. The device of claim 15, wherein said substrate comprises carbon, graphitic substances or composites thereof.

31. The device of claim 15, wherein said substrate has a first side and a second side, and said thin metallic layer, said nickel alloy layer, and said magnetic layer are applied to only said first side of said substrate.